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10/658,216	09/08/2003	Erik R. Swenson	02453.0022.NPUS00	2715

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HOWREY LLP  
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FALLS CHURCH, VA 22042-2924

EXAMINER
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PARK, JUNG H

ART UNIT	PAPER NUMBER
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2616

MAIL DATE	DELIVERY MODE
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05/10/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/658,216

Applicant(s)

SWENSON ET AL.

Examiner

Jung Park

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-84 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-84 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Drawings Objections***

1. The drawings are objected to because drawing elements in Figures 2, 11, 18, and 21 need descriptive text label. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Appropriate correction required.

### ***Claim Objections***

2. Claims 55, 57, 61, and 62 are objected to because of the following informalities:
  - a. What is a mean by "a LUT" in claims 55, 57, 61, and 62?

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 53-58 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. Claim 53 recites the limitation "the translating". There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-19, 21-44, 46-50, 53-56, 58-62, 64, 81, and 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shankar et al. (US 2004/0066781, "Shankar").

**Regarding claim 1**, Shankar discloses a system for communicating control information over one or more backplane connections between two or more entities comprising:

- first logic (a logic, not shown, to process VLAN ID within MAC controller, see ¶.43) for storing the control information (storing information within packets, see fig.4 and 500 & 510 fig.5) within a layer of a packet above the physical layer (layer 2 packets, see fig.5); and

- second logic (a logic, not shown, to transfer the packet, see ¶.43 and fig.1-2) for communicating the packet over one or more of the connections (as shown in fig.1-2).

Shankar does not explicitly disclose the limitation of "backplane". However, a backplane is a circuit board that connects several connectors in parallel to each other to make up a complete a computer system. Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to use a backplane network

system to insert some circuit cards into the backplane because of its convenient to install and replace and also reliability of the backplane system.

Regarding claim 2, Shankar discloses, "wherein the control information is stored in at least a portion of one or more fields inserted into the packet by the first logic (store to determine if the incoming packet is addressed to a particular port, see ¶.42)."

Regarding claim 3, Shankar discloses, "wherein the first logic overwrites at least a portion of one or more pre-existing fields in the packet with the control information (source address can be supplied by the transmitting MAC, see ¶.43)."

Regarding claim 4, Shankar discloses, "wherein the two or more entities comprise a switch (fig.3), and the control information is proprietary to the switch (fig.5a-b)."

Regarding claim 5, Shankar discloses, "wherein the switch has ingress and egress ports (ports in fig.2)."

Regarding claim 6, Shankar discloses, "wherein the proprietary control information comprises an identifier of an ingress port of the switch at which the packet was received over a network.

Regarding claim 7, Shankar discloses, "wherein the proprietary control information comprises an identifier of an egress port of the switch at which the packet

will or is expected to be transmitted over a network (egress port for transmitting, see ¶.33; VLAN IDs for ports, see ¶.34 and fig.5)."

Regarding claim 8, Shankar discloses, "wherein the proprietary control information comprises an indicator of whether or not one or more predetermined fields were present in the packet upon receipt thereof at the switch (fig.5 and ¶.34)."

Regarding claim 9, Shankar discloses, "wherein the one or more predetermined fields comprise a VLAN (¶.34)."

Regarding claim 10, Shankar discloses, "wherein the control information is stored in layer two or higher of the packet according to the OSI reference model (layer 2, see fig.5 and ¶.62)."

Regarding claim 11, Shankar discloses, "wherein the control information is stored in layer two of the packet according to the OSI reference model (layer 2, see fig.5 and ¶.62)."

Regarding claim 12, Shankar discloses, "wherein the control information is stored in the MAC sub-layer of the packet (MAC, see ¶.43)."

Regarding claim 13, Shankar discloses, "wherein the control information overwrites at least a portion of a VLAN stored in the MAC sub-layer of the packet (¶.42 and ¶.43)."

Regarding claim 14, Shankar discloses, "wherein the control information overwrites at least a portion of source or destination addresses stored in the MAC sub-layer of the packet (SA and DA, see ¶.42)."

Regarding claim 15, Shankar discloses, "wherein the VLAN comprises op code and tag portions, and the first logic overwrites the op code portion of the VLAN with the control information (op-code and tag, see fig.5 and ¶.44)."

Regarding claim 16, Shankar discloses, "wherein the control information comprises an identifier of the VLAN op code overwritten by the control information (op-code modified, see ¶.76)."

Regarding claim 17, Shankar discloses, "wherein the VLAN is the outer VLAN of a plurality of nested VLANs (fig.1)."

Regarding claim 18, Shankar discloses, "wherein the control information comprises quality of service information for the packet (priority, fig.5 and ¶.67)."

Regarding claim 19, Shankar discloses, "wherein the quality of service information comprises an identifier of a queue for buffering the packet (buffer ...identifying, see ¶.11)."

Regarding claim 21, Shankar discloses, "wherein the control information is communicated in-band over the one or more backplane connections (same channel/network is used for control information and data, see ¶.2)."

Regarding claim 22, Shankar discloses, "wherein the first logic derives at least a portion of the control information from a packet header (identify VLAN ID, see 905 fig.9), and deletes the packet header prior to communication of the packet over the one or more backplane connections (915 fig.9)."

Regarding claim 23, Shankar discloses, "third logic for re-creating at least a portion of the packet header from the control information after communication of the packet over the one or more backplane connections (925 and 930 fig.9)."

**Regarding claim 24**, it is a claim corresponding to claim 1 and is therefore rejected for the similar reasons set forth in the rejection of claim 1.

Regarding claims 25-32, they are claims corresponding to claims 2-9, respectively and are therefore rejected for the similar reasons set forth in the rejection of the claims.

Regarding claim 33, Shankar discloses, "wherein the proprietary control information comprises an indicator of a state of the ingress port of the switch at which the packet was received (identifying ..., see ¶.11)."



Regarding claims 34-38, they are claims corresponding to claims 10-13 and 9, respectively and are therefore rejected for the similar reasons set forth in the rejection of the claims.

Regarding claim 39, Shankar discloses, "one or more fields comprise source or destination addresses (fig.5)."

Regarding claims 40-44 and 46-48, they are claims corresponding to claims 15-19 and 46-23, respectively and are therefore rejected for the similar reasons set forth in the rejection of the claims.

Regarding claims 49 and 50, they are claims corresponding to claim 6 and are therefore rejected for the similar reasons set forth in the rejection of claim 6.

**Regarding claim 53**, Shankar discloses a system for performing load balancing over a plurality of backplane connections between two or more entities, the system comprising:

- first logic (a logic, not shown, to process VLAN ID within MAC controller, see ¶.43) for mapping control information (identifying VLAN ID, see ¶.43) for a packet into one or more identifiers (identifiers in the packets, see fig.5) of one or more of the plurality of connections (PE 1-n, see fig.1), the packet being received at a first entity (one of PEs, see fig.1) coupled to a second entity through one or more connections (second of PEs, see fig.1), and the translating occurring through a data structure (look-up table, see 610 fig.6) configured to allow translation of the control information for the packet (615 fig.6)

into any of the one or more connections coupling the first entity to the second entity (forwarding to other entity, see 620 fig.6); and

- second logic for communicating the packet (a logic, not shown, to transfer the packet, see ¶.43 and fig.1-2) over the identified one or more connections (as shown in fig.1-2).

Shankar does not explicitly disclose the limitation of "backplane connections", which was rejected in claim 1. Therefore, this claim is rejected for the same reasons and motivation set forth in the rejection of claim 1.

Regarding claim 54, it is a claim corresponding to claims 4, 6, and 7 and is therefore rejected for the similar reasons set forth in the rejection of claims 4, 6, and 7.

Regarding claim 55, Shankar discloses, "wherein the first logic comprises a LUT (look-up tables, see fig.4) for maintaining an association between ingress or egress ports (fig.4 and ¶.41), and egress ports associated with the backplane connections (ports, see fig.4 and ¶.41), and the first logic maps a particular ingress or egress ports into one or more backplane-associated egress ports through an access to the LUT (relationship of ports and tables, see ¶.50 and ¶.52)."

Regarding claim 56, Shankar discloses, "wherein the association is programmed into the LUT (¶.50 and ¶.52)."

Regarding claim 58, Shankar does not explicitly disclose, "wherein the two or more entities are each ASICs." ASIC is a chip that is custom designed for a specific application rather than a general-purpose chip such as a microprocessor. Therefore, it

would have been obvious to one of ordinary skill in the art at the time of applicant's invention to use ASIC within PE of Shankar in order to improve performance over general-purpose CPUs, because ASICs are "hardwired" to do a specific job and do not incur the overhead of fetching and interpreting stored instructions.

**Regarding claim 59**, it is a claim corresponding to claim 53, except the limitation of "receiving the packet at a first entity coupled to a second entity through one or more backplane connections (Shankar, 600 fig.6)" and is therefore rejected for the similar reasons set forth in the rejection of claim 53.

Regarding claims 60-62 and 64, they are claims corresponding to claims 54-56, & 58, respectively and are therefore rejected for the similar reasons set forth in the rejection of the claims.

**Regarding claim 81**, it is a claim corresponding to the mapping step in claim 53 and the storing and communication steps in claim 1 and is therefore rejected for the similar reasons set forth in the rejection of claims 1 and 53.

**Regarding claim 83**, it is a claim corresponding to claim 81 and is therefore rejected for the similar reasons set forth in the rejection of claim 81.

7. Claims 20 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shankar in view of Kalkunte et al. (US 2002/0012345, "Kalkunte").

Regarding claims 20 and 45, Shankar discloses, "wherein the control information comprises an indicator that the packet is a candidate for dropping (drop, see ¶.113)." Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to apply the method of drop packets taught by Kalkunte into the forwarding method of Shankar in order to maximize/optimize memory utilization based on ports.

8. Claims 51 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shankar in view of Williams (US 7031325, "Williams").

Regarding claims 51 and 52, Shankar lacks what Williams discloses, "third logic (MAC logic, see 780 fig.7) for maintaining a mode bit (op-code, see 780 fig.7) having first and second states (insert or modify, see 780 fig.7), wherein the first logic is configured to add one or more fields to the packet layer to accommodate the control information (insert VLAN tag, see 780 fig.7 and col.12, ln.2-12) if the mode bit is in the first state (without the VLAN tag, see 780 fig.7), and overwrite at least a portion of one or more pre-existing fields in the packet layer (modified, 780 fig.7) with the control information if the mode bit is in the second state (state for modifying, see 780 fig.7)." Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to apply the op-code examining method taught by Williams into the VLAN tagging engine disclosed by Shankar in order for the engine to operate in accordance with multiple protocols.

9. Claims 57 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shankar in view of Bare (US 2003/0142685, "Bare").

Regarding claims 57 and 63, Shankar lacks what Bare discloses, "wherein the association is pre-determined to achieve a desired load balancing of packets over the plurality of backplane connections (load balancing, see ¶.28 and ¶.383)." Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to apply the load balancing protocols taught by Bare into the tagging engine of Shankar in order to optimize the utilization of available throughput in the network of switches.

10. Claims 65-80, 82, and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shankar in view of Lou et al. (US 7173935, "Lou").

**Regarding claim 65**, it is a claim corresponding to claim 1, except the limitation of "a first switch coupled to a second switch and having a greater number of ports than the second switch." However, Lou discloses, "a first switch coupled to a second switch and having a greater number of ports than the second switch (Lou, col.30, ln.20-25)." Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to have a greater number of ports in a first switch taught by Lou into the VLANs of Shankar in order to implement different VLAN domains and to have backup ports in the first switch when the ports of the first switch are used as ingress ports.

Regarding claim 66, it is a claim corresponding to claim 4 and 6 and is therefore rejected for the similar reasons set forth in the rejection of claims 4 and 6.

Regarding claim 67, it is a claim corresponding to claim 4 and 7 and is therefore rejected for the similar reasons set forth in the rejection of claims 4 and 7.

Regarding claims 68-72, they are claims corresponding to claims 10-15, respectively and are therefore rejected for the similar reasons set forth in the rejection of the claims.

**Regarding claim 73**, it is a claim corresponding to claim 65 and is therefore rejected for the similar reasons set forth in the rejection of claim 65.

Regarding claims 74-80, they are claims corresponding to claims 66-72, respectively and are therefore rejected for the similar reasons set forth in the rejection of the claims.

Regarding claims 82 and 84, Shankar discloses, "wherein the two or more entities comprise a switch", but lacks what Lou discloses, "the system further means for extending the number of ports of switch (col.30, ln.20-25)." Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to have a means to extend the number of ports according to their needs in switch taught by Lou into the VLANs of Shankar in order to implement different VLAN domains and to have backup ports in the first switch.

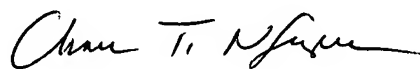
### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jung Park whose telephone number is 571-272-8565. The examiner can normally be reached on Mon-Fri during 6:15-3:45.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on 571-272-3126. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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